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ABSTRACT

This paper describes the use of an automated performance support system, the Mental Retardation-Expert (MR-E), in the training of 16 student clinicians to think "functionally" about undesirable behaviors of persons with mental retardation or developmental disabilities (MR/DD). The MR-E models human expertise in behavioral diagnosis and treatment, expanded and supported by the current scientific literature. The MR-E assists in the development of functionally based treatment protocols for individuals with MR/DD who engage in significant disruptive behaviors. The MR-E also provides an interactive process of case consultation and a basic understanding of the relationship between functional hypotheses and treatment. A pretest versus posttest strategy was applied to the environmental group (N=16) and control group (N=7), producing results that indicated that both training and interactive experience with the MR-E lead inexperienced clinicians to accept its recommendations. (DB)

The Impact of Automated Expert Assistance on the Training of Mental Retardation Professionals

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Abstract

This presentation describes the use of an automated performance support system, the Mental Retardation-Expert (MR-E) in the training of students to think "functionally" about undesirable behaviors. MR-E models human expertise in behavioral diagnosis and treatment, expanded and supported by the current scientific literature. Typically, MR-E assists in the development of functionally based treatment protocols for individuals with MR/DD who engage in significant disruptive behaviors. However, a typical consultation provides not only the specific treatment information contained in the consultation report but also an interactive process of case consultation and a basic understanding of the relationship between functional hypotheses and treatment. The results indicated that training and interactive experience with MR-E lead inexperienced clinicians to accept its recommendations.

Increasingly, computers support a variety of tasks in the field of mental retardation or developmental disabilities (MR/DD). Automated systems are used to manage programs (e.g., scheduling, financial tracking, personnel tracking, etc.), to support clinical services (e.g., client behavioral data collection and analysis, documentation of critical events, etc.), and to coordinate services (e.g., provide data electronically to remote sites, coordinating treatments from various vendors, etc.) (Jacobson, 1989). However, to date, little attention has been focused on the use of computers to support functional assessments or treatment planning.

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The Mental Retardation-Expert (MR-E) is an automated performance support system that helps clinicians develop treatment plans for individuals with MR/DD who engage in disruptive behaviors. Using expert system concepts (Walls, 1989), MR-E models human expertise in behavioral diagnosis and treatment, expanded and supported by the current scientific literature. MR-E guides the clinician in conceptualizing functional hypotheses, in assessing individual client capabilities, and in developing specific treatment recommendations (Hile & Desrochers, in press). This study examines the relative contributions of some of MR-E's components. Specifically, does the process of learning and using MR-E increase the impact of the system's expert consultation reports?

Participants and Methods

Undergraduate and graduate students, enrolled in psychology and education classes, were randomly divided into experimental and control groups. The experimental design was a 2 (experimental vs. control group) by 2 (pre-test vs. post-test) design with the groups receiving different levels of experience with MR-E (see Figure 1). During the pre-test, each student individually read and completed a protocol consisting of a standardized target client description, a free form data sheet to record their functional hypotheses and treatment recommendations, a checklist to identify functional hypotheses, and a checklist to identify treatment selections. For the experimental group, MR-E was demonstrated and a sample consultation was conducted to teach the participants about the system, its development, and its utility. Following this training, the experimental group, led by the first author, used MR-E to obtain consultation on the target client. This consultation was directed so that the results agreed with the MR-E gold standard treatment report for the target client. During the post-test, both the experimental and control groups used the consultation report obtained by the experimental group to help complete the same questionnaires used in the pre-test. The control group received the system demonstration and training after completing the post-test. This design allowed us to evaluate the effects of the independent variable, the degree of training and experience with MR-E, on clinician agreement with the MR-E gold standard report.

Group	Pre-test	Training	Consultation	Post-test
Experimental	Yes	With additional cases	Obtain consultation	Yes
Control	Yes	-	-	Yes

Figure 1. Experimental design

Results and Discussion

Sixteen students participated in the experimental condition and 7 in the control group. For the purposes of this study, only the data from the checklist of functional hypotheses was analyzed. Since the consultations used by both the experimental and control groups were the same as the gold standard treatment report, the students' pre-test and post-test functional hypotheses were compared to the MR-E standard using the interobserver reliability coefficient (IOR, Kazdin, 1982). Figure 2 shows that the experimental group's agreement with the MR-E standard increased significantly following training (t (15) = 5.11, $p < .001$) while the control group showed no significant change.

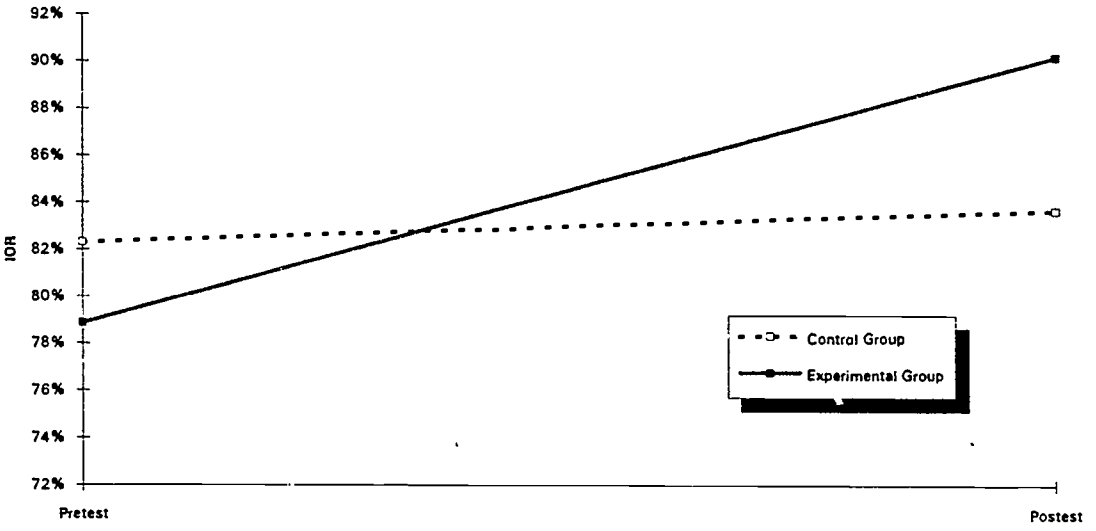

Figure 2. Effect of MR-E training on student performance.

These results support the importance of the interactive component in decision support systems. Only when clinicians interact with system, do they heed its advice. Inexperienced clinicians change their hypotheses only after they have come to understand MR-E and have used the system to obtain a consultation. The increase in agreement shown by the experimental group was due to their experience with MR-E. This experience included a systematic introduction to the concepts embodied in a performance support system, a demonstration of MR-E's various components, a demonstration of a functional consultation, and a group interaction with the system to obtain a consultation on the target case. Furthermore, the post-test level of agreement achieved by this group approximated the level of agreement found between experienced clinicians and MR-E in other studies (Hile, Ghobary, & Campbell, 1993). This suggests that MR-E may be effective in increasing the performance of novice clinicians to levels approximating those of their more experienced counterparts.

It is also important to note that the provision of the consultation report alone did not increase the control group's level of agreement with the gold standard report. This finding

counters the fear that individuals will uncritically follow the recommendations offered by an automated system. In this study, inexperienced users, who might be expected to be easily persuaded by a report from an automated system, were not swayed by simply reading treatment recommendations. To have an impact the users may need to be persuaded that the system has a broad basis and expertise.

Our results suggest that users are not passive recipients of expertise. As in human based consultations, clinicians need to accept in the qualifications of the expert, they need to interact with the expert to arrive at an understanding of the problem and treatments, and they need to use that information to reach their own conclusions. When such information is provided, MR-E enhances the performance of novice clinicians.

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